Abbas Askar

Nationality: Pakistani
Date of birth: 31 August 1987
Mailing Address:
Box 43,
SE-221 00 Lund
Sweden

Email:
askar@astro.lu.se
abbas.askar@gmail.com
Webpage:
https://abbasaskar.com/
Phone: +48 887 746 384

As of June 2018, I am a Carl Tryggers postdoctoral researcher at Lund Observatory, Department of Astronomy and Theoretical Physics of Lund University in Sweden. I work on dynamical evolution of dense stellar systems and my research focuses on populations of compact objects and exotic binary systems in globular clusters.

SCIENTIFIC APPOINTMENTS/POSITIONS

- Lund Observatory, Department of Astronomy and Theoretical Physics, Lund University, Lund, Sweden **06/2018 to present**

Postdoctoral Researcher (Carl Tryggers Fellow)

- Nicolaus Copernicus Astronomical Center, Warsaw, Poland **11/2013 to 05/2018**

Graduate Student/Research Assistant

EDUCATION

- **PhD in Astronomy & Astrophysics (with distinction)** **11/2013 to 05/2018**

Nicolaus Copernicus Astronomical Center (CAMK)
Polish Academy of Sciences, Warsaw, Poland
Supervisor: Dr. Mirek Giersz
Group: Dynamics of Stellar Systems
MOCCA (Monte Carlo Cluster Simulator) Code Team Member
Thesis: *"Investigation of Black Hole Populations in Dense Stellar Systems using MOCCA code for Star Cluster Simulations"*

- **Master of Science in Astronomy & Astrophysics** **10/2010 to 9/2012**

AstroMundus-Erasmus Mundus Joint Masters Program in Astrophysics
University of Innsbruck, Austria (1st semester)
University of Padova, Italy (2nd & 4th semesters)
University of Belgrade, Serbia (3rd semester)
Final Mark: 105/110

- **Bachelor of Science (Honors) & Bachelor of Arts (Honors) in Liberal Arts & Sciences** **08/2006 to 07/2009**

University College Utrecht, Utrecht University, The Netherlands
Double Major in Physical Sciences (Physics & Mathematics)
& Humanities (Philosophy & Religious Studies)

- **GCE Advanced & Ordinary Level** **09/2001 to 06/2006**

University College Lahore, Lahore, Pakistan
5 years of the British high school curriculum

REFEREED PUBLICATIONS

• B. Leor, V. Cardoso, S. Nissanke, T. P Sotiriou, **A. Askar**, C. Belczynski,
G. Bertone, E. Bon, D. Blas, R. Brito & 192 coauthors
Black holes, gravitational waves and fundamental physics: a roadmap
(White Paper for the COST action "Gravitational Waves, Black Holes, and Fundamental Physics" - Submitted).

• J. Hong, E. Vesperini, **A. Askar**, M. Giersz, and M. Szkudlarek:
Binary Black Hole Mergers from Globular Clusters: the Impact of Globular Cluster Properties
(Submitted to MNRAS 2018).

• J. Samsing, D.J D'Orazio, **A. Askar**, and M. Giersz:
Black Hole Mergers from Globular Clusters Observable by LISA and LIGO:
Results from post-Newtonian Binary-Single ScatteringsInteractions In Globular Clusters
(Submitted to Phys. Rev. D 2018)
http://adsabs.harvard.edu/abs/2018arXiv180208654S.

• J. Morawski, M. Giersz, **A. Askar**, and K. Belczynski
MOCCA-SURVEY Database I: Assessing GW kick retention fractions for BH-BH mergers in globular clusters .
(Submitted to MNRAS 2018).
http://adsabs.harvard.edu/abs/2018arXiv180201192M

• K. Belczynski, J. Klencki, G. Meynet, C. L Fryer, D. A Brown, M. Chruslinska, W. Gladysz,
R. O'Shaughnessy, T. Bulik, E. Berti, D. Holz, D. Gerosa, M. Giersz, S. Ekstrom, C. Georgy,
A. Askar, J.P Lasota,D. Wysocki:
GW170104 and the origin of heavy, low-spin binary black holes via classical isolated binary evolution
normalsize (Submitted to Journal).
http://adsabs.harvard.edu/abs/2017arXiv170607053B.

• M. Arca-Sedda, **A. Askar**, and M. Giersz,
MOCCA-SURVEY Database I. Unravelling black hole subsystems in globular clusters.
(Submitted to MNRAS 2018).
http://adsabs.harvard.edu/abs/2018arXiv180100795A

• **A. Askar**, M. Arca-Sedda, and M. Giersz,
MOCCA-SURVEY Database I: Galactic Globular Clusters Harbouring a Black Hole Subsystem.
(Vol. 478, Issue 2, p.1844-1854 MNRAS 2018).
http://adsabs.harvard.edu/abs/2018MNRAS.478.1844A

• K. Belczynski, **A. Askar**, M. Arca-Sedda, M. Chruslinska, M. Donnari, M. Giersz,
M. Benacquista, R. Spurzem, D. Jin, G. Wiktorowicz and D. Belloni:
The The origin of the first neutron star – neutron star merger.
(Accepted for Publication in A&A 2018).
http://adsabs.harvard.edu/abs/2017arXiv171200632B

• J. Samsing, **A. Askar**, M. Giersz:
MOCCA-SURVEY Database I: Eccentric Black Hole Mergers During Binary-Single
Interactions In Globular Clusters (ApJ 2018 Vol. 855, 2, article id. 124, 5 pp.)
http://adsabs.harvard.edu/abs/2018ApJ...855..124S.

• **A. Askar**, M. Giersz, W. Pych, E. Dalessandro:
COCOA code for creating mock observations of star cluster models
(MNRAS 2017 Vol 475, Issue 3, p.4170-4185).
http://adsabs.harvard.edu/abs/2018MNRAS.475.4170A

• J. Hong, R. de Grijs , **A. Askar**, P. Berczik, C. Li, L. Wang, L. Deng,
M. B. N. Kouwenhoven, M. Giersz, M., R. Spurzem:
The dynamical origin of multiple populations in intermediate-age clusters in the Magellani clouds
(MNRAS 2017 Vol 472, 1, p.67-77).
http://adsabs.harvard.edu/abs/2017MNRAS.472...67H

- D.Belloni, **A. Askar**, M. Giersz, P. Kroupa, M.Giersz & H.J, Rocha-Pinto:
On the initial binary population for star cluster simulations
(MNRAS 2017 Vol 471, 3, p.2812-2828).
http://adsabs.harvard.edu/abs/2017MNRAS.471.2812B

- D.Belloni, M. Zorotvic, M.Schreiber, N.W.C Leigh, M.Giersz & **A. Askar**:
MOCCA-SURVEY database I. Accreting white dwarf binary systems in globular clusters – III. Cataclysmic variables – Implications of model assumptions
(MNRAS 2017 Vol. 468, 2, p.2429-2446).
http://adsabs.harvard.edu/abs/2017MNRAS.468.2429B

- R.d. Vita, M. Trenti, P. Bianchini, **A. Askar**, M. Giersz, G. van de Ven:
Prospects for detection of intermediate-mass black holes in globular clusters using integrated-light spectroscopy (MNRAS 2017 Vol. 467, 4, p.4057-4066).
http://adsabs.harvard.edu/abs/2017MNRAS.467.4057D

- **A. Askar**, M. Szkudlarek, D.Gondek-Rosińska, M. Giersz, T. Bulik:
MOCCA-SURVEY Database - I. Coalescing binary black holes originating from globular clusters (MNRASL 2017 Vol. 464, p.L36-L40).
http://adsabs.harvard.edu/abs/2017MNRAS.464L..36A

- **A. Askar**, P. Bianchini, R.d. Vita, M. Giersz, A. Hypki, S. Kamann:
MOCCA-SURVEY Database I: Is NGC 6535 a dark star cluster harbouring an IMBH?
(MNRAS 2017 Vol 464,3, p.3090-3100).
http://adsabs.harvard.edu/abs/2017MNRAS.464.3090A

- D. Belloni, M. Giersz, H.J, Rocha-Pinto, N.W.C Leigh, **A. Askar**:
MOCCA-SURVEY database I. Accreting white dwarf binary systems in globular clusters - II. Cataclysmic variables - progenitors and population at birth
(MNRAS Vol 464, 4, p.4077-4095).
http://adsabs.harvard.edu/abs/2017MNRAS.464.4077B

- D. Belloni, M. Giersz, **A. Askar**, N.W.C Leigh, A.Hypki:
MOCCA-SURVEY database I. Accreting white dwarf binary systems in globular clusters - I. Cataclysmic variables - present-day population (MNRAS Vol 462, 3, p.2950-2969).
http://adsabs.harvard.edu/abs/2016MNRAS.462.2950B

- L. Wang, R. Spurzem, S. Aarseth, M. Giersz, **A. Askar**, P. Berczik, T. Naab, R. Schadow, M. B. N. Kouwenhoven: *The DRAGON simulations: globular cluster evolution with a million stars* (MNRAS Volume 458, 2, p.1450-1465).
http://adsabs.harvard.edu/abs/2016MNRAS.458.1450W

- M. Giersz, N. Leigh, A. Hypki, N. Lützgendorf, **A. Askar**:
MOCCA code for star cluster simulations - IV. A new scenario for intermediate mass black hole formation in globular clusters (MNRAS Volume 454, 3, p.3150-3165).
http://adsabs.harvard.edu/abs/2015MNRAS.454.3150G

CONFERENCE PROCEEDINGS

- M. Giersz, N. Leigh, A. Hypki, **A. Askar**, N. Lützgendorf:
Formation mechanisms of IMBH in globular clusters (MmSAI v.87, p.555 2016).
http://adsabs.harvard.edu/abs/2016MmSAI..87..555G

- D. Belloni, M. Giersz, **A. Askar**, Hypki:
Cataclysmic variables in globular clusters . First results on the analysis of the MOCCA simulations database (MmSAI v.87, p.551 2016).
http://adsabs.harvard.edu/abs/2016MmSAI..87..551B

- **A. Askar**, M. Giersz, W. Pych, A. Olech, A. Hypki:
MOCCA code for star cluster simulation: comparison with optical observations using COCOA (IAU Symposium, Volume 312, pp. 262-263 2016).
http://adsabs.harvard.edu/abs/2016IAUS..312..262A

- M. Giersz, N. Leigh, M. Marks, A. Hypki, **A. Askar**:
Monte Carlo modeling of globular star clusters: many primordial binaries and IMBH formation (IAU Symposium, Volume 312, pp. 213-222 2016).
http://adsabs.harvard.edu/abs/2016IAUS..312..213G

OTHER WORK EXPERIENCE

- SRON Netherlands Institute for Space, Utrecht, The Netherlands **05/2009 to 07/2009**

Undergraduate Researcher
Worked full time for 3 months on a research project at the High Energy Astrophysics Division of SRON.

- Lahore Law Publications, Lahore, Pakistan **09/2005-02/2006**

System Analyst & Programmer.
Designed, implemented and tested an order processing system.
Internship A-Level Coursework

CONFERENCES & TALKS

- Talk on *"Black Hole Subsystems in Galactic Globular Clusters"* at MODEST 18 (Santorini, Greece 2018)
- Talk on *"Investigating Black Hole Populations in Globular Clusters with MOCCA Code for Star Cluster Simulations"* at Galileo Galilei Department of Physics and Astronomy, University of Padova/INAF-Astronomical Observatory of Padova (Padova, Italy 2018).
- Talk on *"Investigating Black Hole Populations in Globular Clusters with MOCCA Code for Star Cluster Simulations"* at Eötvös Loránd University (Budapest, Hungary 2018).
- Talk on *"MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at Numerical Scattering Workshop, Center for Computational Astrophysics, Flatiron Institute, (New York City, USA 2017).
- Talk on *"Gravitational Waves and High Energy Sources Originating From Globular Clusters"* at MODEST 17 (Prague, Czech Republic 2017).
- Talk on *"MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at Lund Observatory Seminar (Lund, Sweden 2017).
- Talk on *"MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at Nicolaus Copernicus Center Wednesday Colloqium (Warsaw, Poland 2017).
- Talk on *"Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at Koło Naukowe Astronomów (Student's Astronomy Circle), University of Warsaw Observatory (Warsaw, Poland 2017).
- Talk on *"Coalescing Binary Black Holes Originating from Globular Clusters"* at Heraeus-Seminar 61: Stellar Aggregates (Bad Honnef, Germany 2016).
- Talk on *"MOCCA-Survey Database I: Binary Black Holes and Intermediate Mass Black Holes in Globular Clusters"* at KIAA/Peking University Lunch Talk (Beijing, China 2016).
- Talk on *"Merging Binary Black Holes Originating from Globular Clusters"* at Astro-GR 2016 Meeting (Benasque, Spain 2016).
- Presented poster on *"Simulating Observations of MOCCA Star Cluster Simulations with COCOA"* at EES 2015 School on Stellar Clusters (Banyuls sur Mer,France 2015).
- Talk on *"Simulating Observations of MOCCA Star Cluster Simulations with COCOA"* at MODEST 15 (Concepcion, Chile 2015).
- Poster presentation, *"MOCCA Code for Star Cluster Simulations: Comparison with Optical Observations using COCOA"* at International Conference of Young Astronomers (Toruń, Poland 2014).
- Poster entitled, *"MOCCA Code for Star Cluster Simulations: Comparison with Optical Observations using COCOA"* (presented by M. Giersz) at IAUS 312: Star Clusters & Black Holes in Galaxies across Cosmic Time (Beijing, China 2014).
- Presented a talk on *"X-ray Bursts"* at the 5th Serbian Astronomical Student Workshop hosted by University of Belgrade and University of Novi-Sad (Belgrade, Serbia 2011).

MASTERS & UNDERGRADUATE PROJECTS

- **Optical Counterparts of Ultraluminous X-ray Sources** **03/2012 to 9/2012**

Astromundus Course Master Thesis
Supervisor: Dr. Luca Zampieri
INAF-Astronomical Observatory of Padova & Department of Physics & Astronomy

University of Padova, Italy
Grade: 30+/30

- **Peculiar Features in the Onsets of Thermonuclear Flashes on Neutron Stars** **05/2009 to 07/2009**

SCI 301: Natural Science Bachelor Thesis
Supervisor: Dr. Jean in't Zand (SRON)
High Energy Astrophysics Division, SRON Netherlands Institute for Space Research
Utrecht, The Netherlands
Grade: A

- **The Problem of Redemptive Truth**: From Nietzsche to a **Post-Metaphysical Culture** **05/2008 to 08/2008**

HUM 301: Humanities Bachelor Thesis
Supervisor: Dr. Floris van der Burg
University College Utrecht, Utrecht University, The Netherlands
Grade: A

GRANTS, SCHOLARSHIPS & AWARDS

- Carl Tryggers Fellowship for post-doctoral research awarded by the Carl Tryggers Foundation (2018 to 2020)
- Preludium grant for PhD students awarded by the Polish National Science Center (2016 to 2018)
- Nicolaus Copernicus Astronomical Center Grant for Young Researchers (2015 to 2017)
- PhD Scholarship in Stellar Dynamics, National Science Center, Poland (2013 to 2017)
- Erasmus Mundus Scholarship for Master Studies in Astrophysics and Astronomy (2010 to 2012)
- Excellence Scholarship for Undergraduate Studies at University College Utrecht (Utrecht University) (2006-2009)
- Merit Scholarship for A Levels at University College Lahore (2004-2006)
- Award for Excellence in Computing, University College Lahore (2005)

TEACHING & STUDENT SUPERVISION

- Co-supervised summer student projects at Nicolaus Copernicus Astronomical Center:
  - Jakub Morawski (2017 Bachelor Student, Warsaw Observatory)
  - Piotr Kołodziejski (2016 Bachelor Student, Warsaw Observatory)
  - Jakub Klencki (2016 Master Student, Warsaw Observatory)
  - Piotr Adamczyk (2015 Bachelor Student, Warsaw Observatory)
  - Magdalena Szponar (2015 Bachelor Student, Warsaw Observatory)
- Co-supervised and assisted with Masters thesis project of Riko Schadow (Ludwig Maximilian University of Munich, 2015) and research project by Arthur Kuehlwein (Heidelberg University, 2015)

SKILLS & MISCELLANEOUS

Languages
- Urdu (Native)
- English (Fluent)-TOEFL (Computer Based) Score: 273/300 (February 2006)
- Punjabi (Intermediate Level)
- Dutch (Beginner Level)

Computer Skills
- Scientific programming in Python, Fortran, shell scripting, C
- Wolfram Mathematica and MATLAB

Extracurricular Activities
- Assembled and setup muon detectors at University College Utrecht (Part of HiSparc project)
- Junior Advisor at University College Utrecht (2007-2008)
- Represented University College Lahore in many nationwide quiz competitions (2001 to 2006)
- Member of University College Lahore debating team in All-Pakistan parliamentary style debates at Under 17 & Under 19 Level between 2001 & 2006